universal constituent code, the Turbo Codes having compatible puncturing patterns, the method comprising the steps of:

encoding a signal at a first and second encoder using a rate 1/2 constituent code that is universal with higher and lower code rates and provides the lowest signal-to-noise ratio loss for the different Turbo code rates and the different frame sizes, the first encoder and the second encoder each producing a respective plurality of parity bits for a data bit; and

performing one of the following steps:

puncturing the respective plurality of parity bits at each encoder with a higher rate puncturing pattern that provides the lowest signal-to-noise ratio loss for the different Turbo code rates and the different frame sizes; and

puncturing the respective plurality of parity bits at each encoder with a lower rate puncturing pattern that provides the lowest signal-to-noise ratio loss for the different Turbo code rates and the different frame sizes.

19.   (New) A method according to claim 18, wherein the best rate 1/2 constituent code represents a concatenation of polynomial $1+D^2+D^3$ (octal 13) and polynomial $1+D+D^3$ (octal 15), D a data bit.

20.   (New) A method according to claim 18, wherein one of the rate-compatible Turbo Codes in the set comprises a rate 1/2 Turbo Code and further wherein one of the puncturings comprises alternately puncturing parity bits between the first and the second encoder.

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21. (New) A method according to claim 18, wherein one of the rate-compatible Turbo Codes in the set comprises a rate 1/3 Turbo Code and further wherein one of the puncturings comprises transmitting all the parity bits at the first and second encoder.

22. (New) A method of processing data in data services using a set of rate-compatible Turbo Codes derived from an optimal universal rate 1/3 constituent code, the Turbo Codes having similar constituent codes and compatible puncturing patterns, the method comprising:

encoding a signal with a rate 1/3 constituent code at a first and a second encoder that provides the lowest signal-to-noise ratio loss for the different Turbo code rates and the different frame sizes, each encoder producing a respective plurality of parity bits for each data bit; and
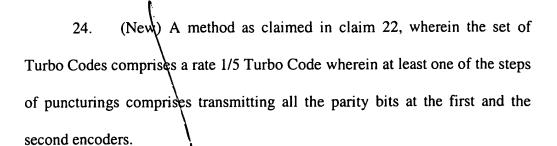
performing one of the following steps:

puncturing the plurality of parity bits with the a higher rate puncturing pattern that provides the lowest signal-to-noise ratio loss for the different Turbo code rates and the different frame sizes; and

puncturing the plurality of parity bits with a lower rate puncturing pattern that provides the lowest signal-to-noise ratio loss for the different Turbo code rates and the different frame sizes.

23. (New) A method as claimed in claim 22, wherein the best rate 1/3 constituent code represents a concatenation of polynomial $1+D^2+D^3$, (octal 13), polynomial $1+D+D^3$ (octal 15), and polynomial $1+ 1+D+D^2+D^3$ (octal 17), D a data bit.

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24.   (New) A method as claimed in claim 22, wherein the set of Turbo Codes comprises a rate 1/5 Turbo Code wherein at least one of the steps of puncturings comprises transmitting all the parity bits at the first and the second encoders.

25.   (New) A method as claimed in claim 22, wherein the set of Turbo Codes comprises a rate 1/4 Turbo Code wherein at least one of the puncturing comprises:

alternately puncturing a select group of the plurality of parity bits between the first and the second encoder.

26.   (New) A method as claimed in claim 22, wherein the set of Turbo Codes comprises a rate 1/3 Turbo Code wherein at least one of the puncturings comprises:

puncturing a select group of the plurality of parity bits at the first and the second encoder.

27.   (New) A method as claimed in claim 22, wherein the set of Turbo Codes comprises a rate 1/2 Turbo Code and further wherein at least one of the puncturings comprises:

puncturing at the encoders a select group of the plurality of parity bits and alternately puncturing at the encoders another select group of the plurality of parity bits.

28. (New) A method of rate-compatible Turbo encoding using a set of rate-compatible Turbo Codes, the set optimized for code rate 1/4, and comprising Turbo Codes with differing code rates and rate-compatible puncturing patterns, the method comprising the steps of:

encoding a signal at a first and second encoder using a rate 1/4 constituent code universal with higher and lower code rates that provides the lowest signal-to-noise ratio loss for the different Turbo code rates and the different frame sizes, the first encoder and the second encoder each producing a respective plurality of parity bits for a data bit; and

performing one of the following steps:

puncturing the respective plurality of parity bits at each encoder with a higher rate puncturing pattern that provides the lowest signal-to-noise ratio loss for the different Turbo code rates and the different frame sizes; and
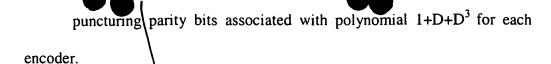
puncturing the respective plurality of parity bits at each encoder with a lower rate puncturing pattern that provides the lowest signal-to-noise ratio loss for the different Turbo code rates and the different frame sizes.

29. (New) A method as claimed in claim 28, wherein the set of rate-compatible Turbo Codes represent a concatenation of polynomials $1+D+D^3$, $1+D^2+D^3$, and $1+D+D^2+D^3$, D a data bit, and wherein an associated rate-compatible puncturing pattern is selected from a group of patterns including:

transmitting all data;

alternately puncturing parity bits associated with polynomial $1+D+D^3$ and

puncturing parity bits associated with polynomial $1+D+D^3$ for each encoder.

30. (New) A method as claimed in claim 28, wherein the set of rate-compatible Turbo Codes comprise two or more Turbo Codes of differing rates selected from a group of rates including 1/5 and 1/4, the Turbo Codes representing a concatenation of polynomials $1+D+D^3$, $1+D^2+D^3$, and $1+D+D^2+D^3$, D a data bit, and wherein an associated rate-compatible puncturing pattern is selected from the group of patterns including:

transmitting all data; and

alternately puncturing parity bits associated with polynomial $1+D+D^2+D^3$.

31. (New) A system for processing data in data services with a set of rate-compatible Turbo Codes optimized at high code rates and derived from a universal constituent code, the Turbo Codes having compatible puncturing patterns, the system comprising:

an encoder, adapted to encode a signal at a first and second encoder using a rate 1/2 constituent code that is universal with higher and lower code rates and provides the lowest signal-to-noise ratio loss for the different Turbo code rates and the different frame sizes, the first encoder and the second encoder each producing a respective plurality of parity bits for a data bit; and

one of the following:

a first puncturer, adapted to puncture the respective plurality of parity bits at each encoder with a higher rate puncturing pattern that provides the

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lowest signal-to-noise ratio loss for the different Turbo code rates and the different frame sizes; and

a second puncturer, adapted to puncture the respective plurality of parity bits at each encoder with a lower rate puncturing pattern that provides the lowest signal-to-noise ratio loss for the different Turbo code rates and the different frame sizes.

32. (New) A system as claimed in claim 31, wherein the best rate 1/2 constituent code represents a concatenation of polynomial $1+D^2+D^3$ (octal 13) and polynomial $1+D+D^3$ (octal 15), D a data bit.

33. (New) A system as claimed in claim 31, wherein one of the rate-compatible Turbo Codes in the set comprises a rate 1/2 Turbo Code and further wherein one of the puncturings comprises alternately puncturing parity bits between the first and the second encoder.

34. (New) A system as claimed in claim 31, wherein one of the rate-compatible Turbo Codes in the set comprises a rate 1/3 Turbo Code and further wherein one of the puncturings comprises transmitting all the parity bits at the first and second encoder.

35. (New) A system of processing data in data services using a set of rate-compatible Turbo Codes derived from an optimal universal rate 1/3 constituent code, the Turbo Codes having similar constituent codes and compatible puncturing patterns. the system comprising:

an encoder, adapted to encode a signal with a rate 1/3 constituent code at a first and a second encoder that provides the lowest signal-to-noise ratio loss for the different Turbo code rates and the different frame sizes, each encoder producing a respective plurality of parity bits for each data bit; and

one of the following:

a first puncturer, adapted to puncture the plurality of parity bits with the a higher rate puncturing pattern that provides the lowest signal-to-noise ratio loss for the different Turbo code rates and the different frame sizes; and

a second puncturer, adapted to puncture the plurality of parity bits with a lower rate puncturing pattern that provides the lowest signal-to-noise ratio loss for the different Turbo code rates and the different frame sizes.

36.   (New) A system as claimed in claim 35, wherein the best rate 1/3 constituent code represents a concatenation of polynomial $1+D^2+D^3$, (octal 13), polynomial $1+D+D^3$ (octal 15), and polynomial $1+ 1+D+D^2+D^3$ (octal 17), D a data bit.

37.   (New) A system as claimed in claim 35, wherein the set of Turbo Codes comprises a rate 1/5 Turbo Code wherein at least one of the steps of puncturings comprises transmitting all the parity bits at the first and the second encoders.

38.   (New) A system as claimed in claim 35, wherein the set of Turbo Codes comprises a rate 1/4 Turbo Code wherein at least one of the puncturing comprises: